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FOREIGN BODIES IN THE URETHRA AND BLADDER. REMOVAL BY THE LITHOLAPAXY EVACUATOR WITH LARGE, STRAIGHT, OPEN-ENDED CANULA.

By DE FOREST WILLARD, M.D.

[Read November 9, 1887.]

My object in bringing before you the subject of urethral and vesical foreign bodies is simply to emphasize the value of the evacuator (ordinarily used in rapid lithotrity to extract the calculous fragments) for removing other more or less solid substances that have found their way into the urinary tract, either by accident or design.

Foreign bodies enter by various routes. Projectiles may reach the viscus and remain in its cavity; bones may be driven in by crushing forces; fœtal remains may ulcerate through from extra-uterine cavities; intestinal contents may occasionally make their way into the bladder, but all these are either rare, or are accompanied by such traumatism that death frequently ensues.

The bodies that we will especially consider are those introduced through the meatus urinarius, urinary calculi being only incidentally considered.

The strong tendency for manipulation of this part of the body that exists from early childhood to decrepit old age, leads to many instances of misadventure. Think of a lad actually sliding a watch-chain down his urethra. Examples of inserted beads, pebbles, sticks, etc., are numerous in childhood. After puberty the tendency becomes more marked as the sexual desire increases. A few years later we find the morbid recluse, especially among the shepherds and monks of former centuries, resorting to intra-urethral stimulation with sticks or other hard substances to arouse the over-exhausted functions, waning from excessive masturbation or venery. Yielding himself to his vile erotic feelings, the instrument often slipped from his fingers and was lost in the canal. Sexually insane must have been the shep-

herd who had used for this purpose his pocket knife, after manual friction and urethral stimulation had proved unsatisfactory, until little by little, through hundreds of these indecent acts he had laid open the entire penis along its dorsal aspect until the pubis was reached, and the penis hung in two halves, united only by the lower wall of the urethra. Then with a short stick he was able to tickle the very orifices of the ejaculatory ducts. This stick slipping into his bladder, became encrusted, and it was not until the pain became torturing, that he confessed the cause. Pipe-stems, pencils, thermometer tubes, glass rods, straws, needles, wires, twigs, hairpins, fruit stones, and even forks and lockets, have all been found in the urethra, after introduction for stimulative purposes, or to relieve dysuria from stricture or other causes. In one instance[1] a man introduced the sewing needle of the girl whom "he desired to fall in love with him."

At the present time we have fewer of these lecherous accidents, save from drunken debauchees, but the majority of instances occur from the use of old or improper catheters or bougies. Of course, these accidents are more frequently found in men than women, as the former are more subject to urethral disease, and are also more erotic, but there are instances in both sexes.

In children, small round bodies, as beads, etc., are found in the anterior part of the canal, while the longer instruments at all ages slip back to the membranous portion of the tube, or into the bladder.

Usually a long foreign body will find its way into the bladder in a few hours; rarely, two or more days may be required. In exceptional, rare cases, rounded bodies remain a long time in the urethra, the urine following a tortuous course around them, and, becoming encrusted, a pocket ultimately forms, or suppuration ensues.

It is not strange that catheters and similar instruments are broken off in the canal when we learn of the recklessness of a man who used one gum catheter for twenty years, or of another who attached two portions of a silver tube simply with sealing wax.

A too short instrument has often eluded the grasp of the surgeon and slipped bladderward.

As to this recedence of instruments, which is strong and actual, there have been many theories. It does not seem strange to me that the compressor muscular fibres of the urethra, when stimulated to action by a body applied in front, should reverse their usual action

[1] Poulet: Foreign Bodies in Surgery.

as easily as do the muscles of the pharynx, œsophagus, intestines, etc. This act of swallowing a hard substance is aided by the erection of the penis, which in its subsidence (should the anterior end of the object become engaged) drives it further and further back with each successive engorgement. Tending to this same unfortunate end are all the manipulations of the part, in the patient's endeavor to extract the offending body.

Unfortunately for the safe extraction of these bodies, the surgeon has to meet with a large amount of deception upon the part of the patient, when the object has been self-introduced, and it is often impossible to obtain any reliable information either as to the presence of the foreign mass or as to its conformation. In broken bougies the surgeon should, if possible, have the other remaining fragment in his hand for measurement, or else secure one of similar size. Any object of peculiar shape should be accurately described, or duplicated. It must be remembered, that while a patient may confess to the introduction of but one body, there may be several. The position in the canal must be thoroughly fixed. In the ante-scrotal region this is easily accomplished, and with the aid of a sound and a finger introduced into the rectum even the posterior urethra can be well examined, provided inflammation be not too severe. When possible, no manipulations should be attempted for extraction without the body being firmly secured from further recedence.

Ether is of the greatest value, but cocaine injections may answer for urethral work.

Treatment.—About one-tenth of inserted foreign bodies will be spontaneously expelled, but when the *vis a tergo* of the urine fails to wash out either a calculus or an object inserted through the meatus, the safest and surest plan is to attach to an ordinary litholapaxy evacuator (Bigelow's or other improved pattern) a large, straight tube, which is open at both ends. It contains a movable stylet for ease of introduction. The size should be the largest that the urethra will possibly admit (after nicking the meatus, if necessary), say French No. 29 or 30; American, No. 19; English, No. 16, for adults; children in proportion. The possibility of the passage of the body through the tube should be determined, if possible, by actual trial, provided a similar piece can be obtained. Rarely will any bougie larger than the above-named size be found in the bladder or urethra.

The method has been so satisfactory in my hands, as is proven by the collection of objects before you, that I always resort to it with confidence, to the exclusion of all other primary devices.

If lodgement has occurred in the urethra, the canal must be firmly closed by finger pressure behind the object, while the metallic tube is slid down and carefully caused to engage the catheter or other mass within its calibre, when the bulb of the instrument is slowly compressed until the water has distended the urethra to its fullest limit, thus liberating the body, when suction is suddenly applied while the penis is stretched forward. Unless the mass be firmly caught and imbedded in a pocket, this manœuvre rarely fails after a few trials. The quantity of water that can be contained in the urethra is so small that the body may require two or three efforts to withdraw it the whole length of the instrument. The water should be injected very slowly, but the suction current must be made forcibly. Inspection of the rubber tube can be made through the upper opening without detachment of the catheter.

Avoid employing forceps until unsuccessful with the above method, but when necessary to be used, the superiority of the canula again asserts itself. The forceps can be manipulated through its calibre, and if the object be compressible enough to pass the bore, withdrawal can be accomplished without the slightest injury to the mucous membrane. Objects of larger size than this tube can seldom be withdrawn with safety by any method save cutting. Hairpins can be compressed through the walls of the urethra, and their points passed into the calibre, when they can be completely pushed within the bore and easily withdrawn.

Beads, peas, pebbles, etc., will easily enter the canula by suction. Catheters, wires, etc., will usually require the assistance of forceps. Barbed heads of grain can also be ensheathed and withdrawn by this device.

If the object has passed into the bladder, the evacuator becomes an even more essential aid. A straight instrument is not always easy of introduction, but the security gained against subsequent urethral injury abundantly repays for the trouble. If a flexible or spirally cut obturator is used, the introduction is rendered much easier. The tube is used first as a sound to discover the offending body, when the bulb of the evacuator is first slowly compressed, so as not to disturb the fragment. Suction should always be made quickly, so as to draw the body with force. Failing, the water is next ejected with more energy, so as to move the fragment into better line with the calibre, suction being again rapidly applied. The hard substances will not be driven against the sides of the bladder with any more power than are calculous fragments, and unless consisting of broken glass will not be

as angular. If the body is rounded, and of size that can pass the bore, it will in a few moments be found in the bulb. If very long, like a catheter, or pencil, or wire, the chances are not so good that it can be brought into line with the calibre of the tube. As a bougie ordinarily breaks at or near the eye, however, its passage is more than probable. Failing, after ten minutes of gentle trial, a lithotrite should be introduced if the body is a bougie or pencil, and is capable of being cut or pinched in two, and the division made. A cutting lithotrite, like Caudemont's, is manufactured, but I presume is seldom found among the paraphernalia of surgeons, and the fenestrated instrument of Thompson is far safer. If the bougie is old and brittle, as is presumptively the case, such division with a lithotrite is easily accomplished. The segments can then be sucked out, and their total length carefully compared with the remaining portion or lost body. Every particle must be secured, lest it form the nucleus of a future calculus. Even the broken jaw of a lithotrite might be drawn into the bore.

If the surgeon has not the straight tube with open end, which I advise, he may use the ordinary straight evacuating tube. Rounded bodies, and pieces of bougie small enough and flexible enough to enter the side opening can often be secured with ease, but long or rigid pieces can only be drawn through the open-ended tube. This tube has the disadvantage that the point must be kept just inside the neck of the bladder. If pushed too far, the posterior bladder wall flaps against it; if withdrawn too much, it is concealed in the prostatic portion, and makes no suction upon the vesical contents. Its safety from impaction of fragments in the eye, however, more than counterbalances this slight trouble; since, in the ordinary evacuating tube, a large fragment often cannot be dislodged from the eye, and lacerates the urethra during withdrawal.

Should these manipulations fail (and if they have been carefully conducted, no injury need have been done to the bladder), I show you now two forms of forceps which I have had made of just sufficient length to be slightly protruded from the end of the tube. In the one, the jaws open by a spring, as in the old Halles' forceps; and in the other, the jaws are worked by handles, as in the Mathieu and Gross, and "alligator" patterns.

Careful attempts can now be made to seize the body and extract it through the catheter. If small enough to be brought through, it is a great satisfaction to know that no possible injury can be done to either the neck of the bladder or the urethra, as is so likely to occur when a body is extracted in the jaws of a lithotrite. Necessarily only a small

proportion of introduced objects can be removed per urethram, and I should lay it down as a rule that any foreign body too large to pass the calibre of this No. 29 tube, unless it be very soft and pliable, should be removed by lithotomy, either perineal or suprapubic. Lithotomy has its dangers, but laceration is worse.

The suprapubic is at present the fashionable operation, and it certainly presents many inducements in its favor. The median perineal operation, however, is a safe one, and gives excellent results. No important structures are severed, and there is seldom troublesome hemorrhage if the raphè is closely followed. By either of the routes great care must be exercised in the search, if the object be sharp-pointed, lest a perforation be made. The inflation of the rectum in order to lift the bladder, must be dispensed with if the object is sharp-pointed. The upper route gives more room, and while there is a slight risk of wounding the peritoneum, yet we must remember also, in the extraction of large objects, as well as calculi, by the perineal route, that the recto-vesical fold of the peritoneum is in close proximity to the neck of the bladder, and may not escape involvement in the subsequent inflammatory action.

If the walls of the bladder were only of sufficient strength to warrant their immediate sewing with catgut or silk, and permit primary union under strictly antiseptic dressings, while the urine were drained off below, the suprapubic route would certainly be decidedly the better one; but as this is not the case, there is still room for honest differences of opinion in the selection of an operation. For the present, we must be content to drain the suprapubic wound.

In the absence of an evacuator, the expulsive force of the urine is often sufficient to dislodge a urethral impaction, especially if the meatus is closed for a moment, so as to obtain the full dilating power of the water. Failing in this effort, if the foreign body can be located and the urethra closed, a large injection of sweet oil may be thrown in, after a hot bath, and the largest possible bougie carried down to the body to stretch the membrane, while pressure from behind is made either by the surgeon's finger or by the expulsive efforts of the patient's bladder.

Should lodgement be made in the fossa navicularis, the spoon of the ordinary pocket-case can often be hooked behind the object and assist in coaxing it forward. A hairpin, or wire doubled upon itself and slightly bent, or a blunt curette, makes also a valuable extractor. An excellent instrument also is the articulated scoop of Leroy d'Étiolles, which, being introduced past the foreign body, has a mechanism by

which its tip is then bent at right angles to the shaft, and is capable of making strong but dangerous traction. The abruptly short-beaked sound which I always use for sounding the bas fond of the bladder, can sometimes also be "wormed" past the obstruction, and effect its dislodgement. I show you here seven prostatic stones that I have thus extracted, aided by the force of the urine. Long urethral forceps are of great service, as they serve partially to protect the canal during extraction, but they do so far less effectually than does the straight tube before described, which should be placed in every evacuating set. Hunter's or Civiale's three-bladed forceps are occasionally used, but I always look with abhorrence upon dragging any object forcibly through the canal. A dangerous instrument is the urethral lithotrite of Reliquet, as *incision* is infinitely safer for all rough and large bodies.

When the substance lies posterior to the triangular ligament, gentle attempts should be made to push it into the bladder, only after the evacuator has failed to dislodge it. If necessary to operate, the raphè should be closely followed, while a large staff is held in position to indicate the location of the obstruction and of the tube.

An incision in front of the scrotum is easily made, and should be closed after the removal of the body by catgut or quilled sutures. Treated antiseptically, and with either a retained catheter, or with frequent catheterizations, immediate union may be confidently expected. The quilled suture gives more perfect rest by its splint action.

If a stricture exists, and the foreign body is lodged behind it, dilatation or free external incision of the stricture should be practised.

In former days, the instruments for search and removal of these objects, greatly exceeded those of the present day, when operative procedures are more common. The "duplicators" of Mercier, and of Charrière, were intended to fold up any soft substance, as a very flexible bougie. Long stiff bodies were seized by "redressors" or "basculeurs," forceps with bevelled blades, constructed so as to rotate the body so that its long axis would correspond with that of the instrument. Occasionally a small lithotrite will answer for either of these purposes, but the great danger of laceration during withdrawal through an unprotected canal, must never be lost sight of.

The curved forceps of Cusco or Voillemier are, perhaps, as useful in the bladder as in the membranous urethra; but I am afraid to use them for the reasons already named, especially since I have found suction so much safer and also more effectual.

For the removal of pins, bonnet pins, or needles, from the urethra, the point can sometimes be imbedded in a wax or gum bougie, but it is

easier washed out with the evacuator. If immovable, the point can be pushed through the walls of the urethra, and by sharply bending the penis, the head after reversal drawn through the tube by suction or by forceps. It is seldom necessary to cut the pin when this method is used.

If a piece of nitrate of silver is lost from a porte-caustique, the evacuator, charged with salt water, should be at once used if the force of urination does not expel the mass.

Many ingenious devices have been practised in the absence of instruments, to rid the urethra of impacted bodies, but the knife is far safer than rough instrumentation. In the absence of the straight evacuating tube, an extra sized catheter, with open end, and a large syringe, might prove useful.

Blood-clots in the bladder are practically foreign bodies, and are best removed by gentle suction through the curved evacuator, or through the blood catheter, which I here show, the large eye of which is closed down during introduction by a spirally cut obturator.

Catheter accidents are so frequent that instruments should be often examined. Only recently I found that the distal extremity of my much-used pocket case instrument could be slipped from its screw-thread by a very small amount of traction. Old gum bougies should be thrown away as soon as they begin to lose their elasticity.

To summarize:

1. The litholapaxy evacuating tube, large, straight, and with open end, is the surest and safest instrument for the removal of foreign bodies from either urethra or bladder.

2. The fenestrated lithotrite should be employed to break up all bodies capable of division.

3. Incision of urethra or bladder is safer than a tear of the neck of the viscus or of the canal.

4. The suprapubic and median perineal are the safest routes of entrance to the bladder when suction fails.

5. Forceps should be used with the greatest care, and always through a straight tube, which insures protection both to the urethra and neck of the bladder during both exploration and extraction.